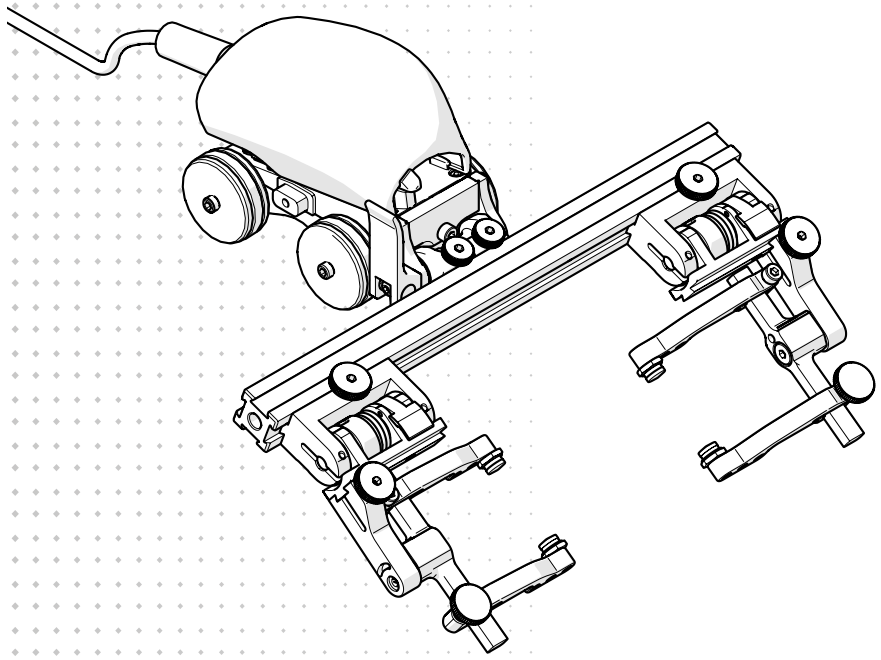
MICROBE



User Manual

Manual Magnetic Scanner

JIREH

SCANNING TECHNOLOGY FOR NDT

KEEP THIS MANUAL – DO NOT LOSE

THIS MANUAL IS PART OF THE ***MICROBE*** AND MUST BE RETAINED FOR THE LIFE OF THE PRODUCT. PASS ON TO SUBSEQUENT OWNERS.
Ensure any amendments are incorporated with this document.

DANGER! The ***MICROBE*** is designed for a specific use. Using the ***MICROBE*** outside of its intended use could cause damage to the product. Read and understand this manual before using.

WARNING! Can be harmful to pacemaker and ICD wearers. Stay at least 25 cm *(10 in)* away.

WARNING! Do **NOT** operate scanner in an explosive environment. Do **NOT** operate scanner in the presence of volatile substances.

The **WEEE** symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

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1. Introduction

1.1. Product information

1.1.1. Intended use

The ***MICROBE*** is a hand held scanner with built in encoder and magnetic wheels. It is designed to translate phased array and/or TOFD probes around ferrous piping and vessels.

1.1.2. Performance specifications

	Minimum	Maximum
Pipe/Tube Range Outer Diameter	38.1 mm *(1.5")*	Flat
Pipe/Tube Range Inner Diameter	152.4 cm (60 in)	Flat
Umbilical Length (Standard Kit)	5 m *(16.4 in)*	
X Axis Encoder Resolution	19.2 counts/mm *(487.7 counts/inch)*	

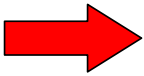
1.1.3. Operating environment

The ***MICROBE*** is designed for use in industrial environments that are between -20°C and 50°C.

1.1.4. Environmental Sealing

Dust tight, water tight (not submersible).

1.2. Definition of symbols

	Instructions to 'look here' or to 'see this part'
	Denotes movement. Instructing user to carry out action in a specified direction.
	Indicates alignment axis, can also indicate insertion or movement of parts.
	Alerts user that view has changed to a reverse angle.

1.3. Hardware

1.3.1. Included tools

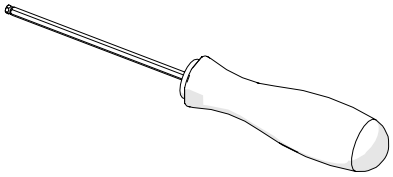


Fig. 1 - 3 mm hex driver

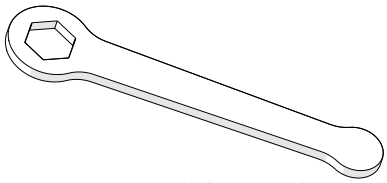


Fig. 2 - 3/8 in wrench

The 3 mm hex driver *(Fig. 1)* is sufficient for all typical operations and adjustments of the ***MICROBE***. The 3/8 in wrench *(Fig. 2)* is used to remove and install buttons on the probe holders.

1.3.2. Optional tools

Some specialized adjustments require tools that are not included with this kit.

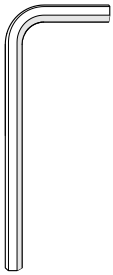


Fig. 3 - 1.5 mm hex wrench

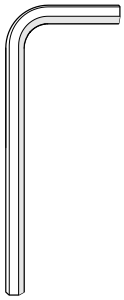


Fig. 4 - 2 mm hex wrench

Fig. 5 - 2.5 mm hex wrench

Fig. 6 - 3 mm hex wrench

1.3.3. Maintenance

General cleaning of components is important to keep your system working well. All components that have no wiring or cables are completely waterproof. Components can be washed with warm water, dish soap and a medium bristle brush.

Before using the scanner, ensure all connectors are free of water and moisture.

NOTE: *All components with wiring, cables or electrical connections are splash proof. However, these components are* ***NOT*** *submersible.*

NOTE: *Never use strong solvents or abrasive materials to clean your scanner components.*

2.1. One Probe Cantilever

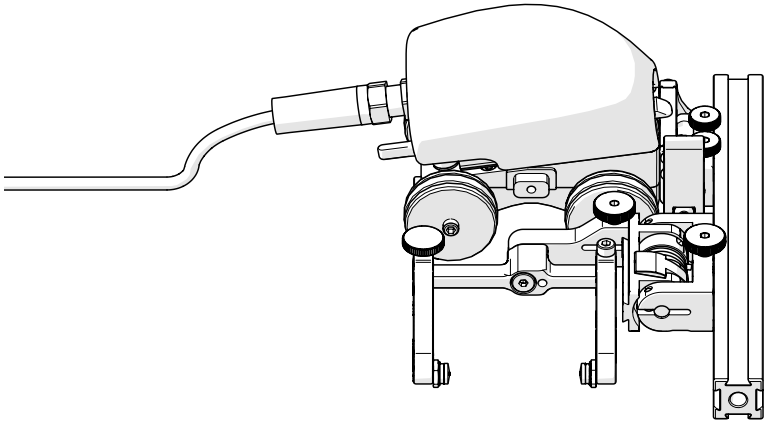


Fig. 7 - One probe cantilever configuration

2.2. Two Probe

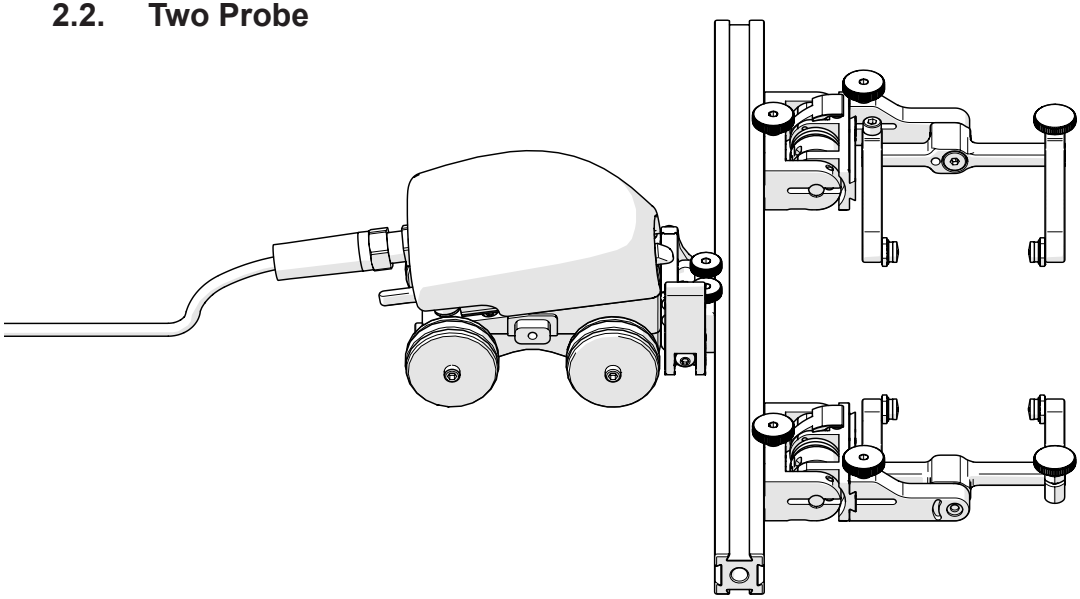


Fig. 8 - Two probe configuration

2.3. Two Probe Cantilever

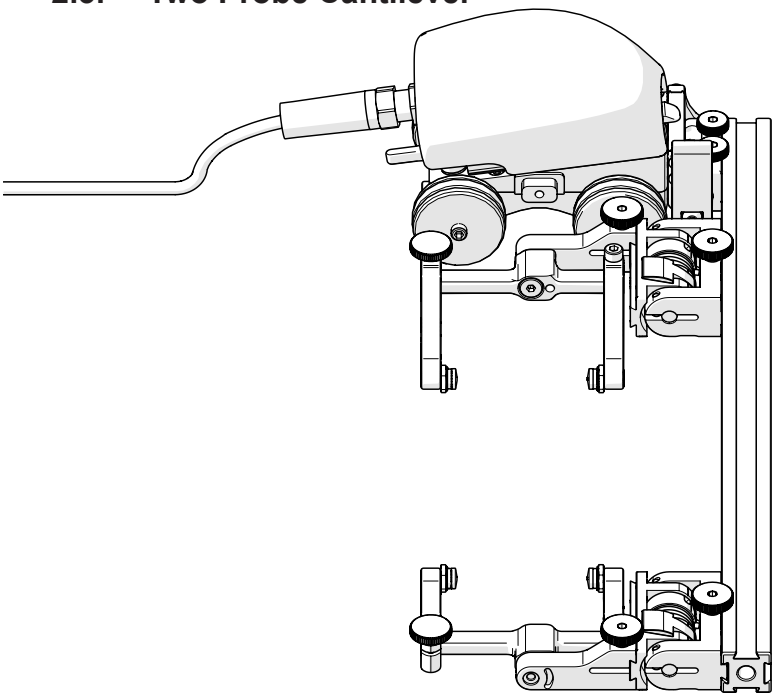


Fig. 9 - Two probe cantilever configuration

2.4. Four Probe

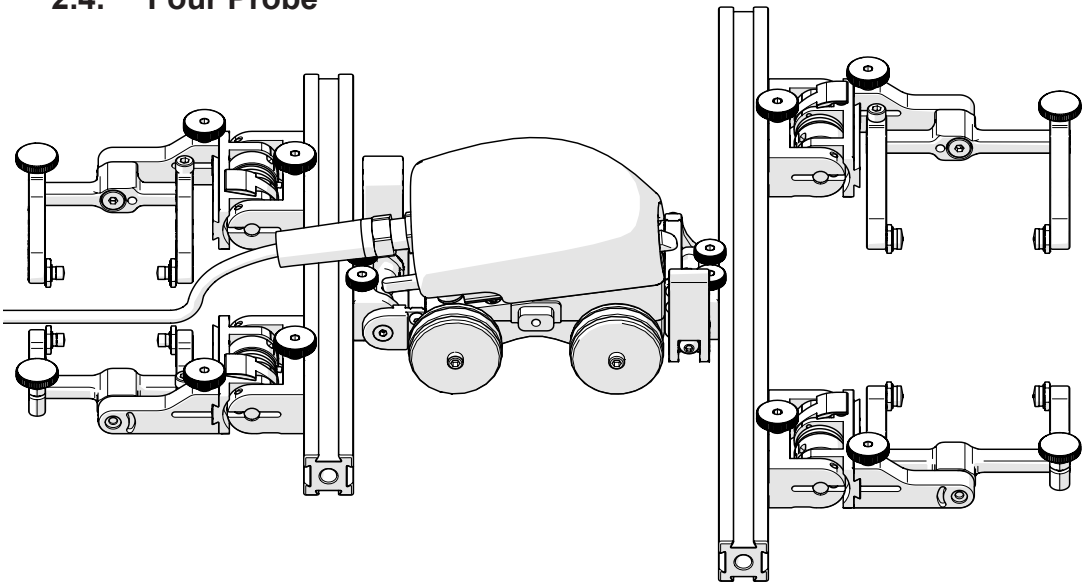


Fig. 10 - Four probe configuration

3.1. Microbe Setup on a Scanning Surface

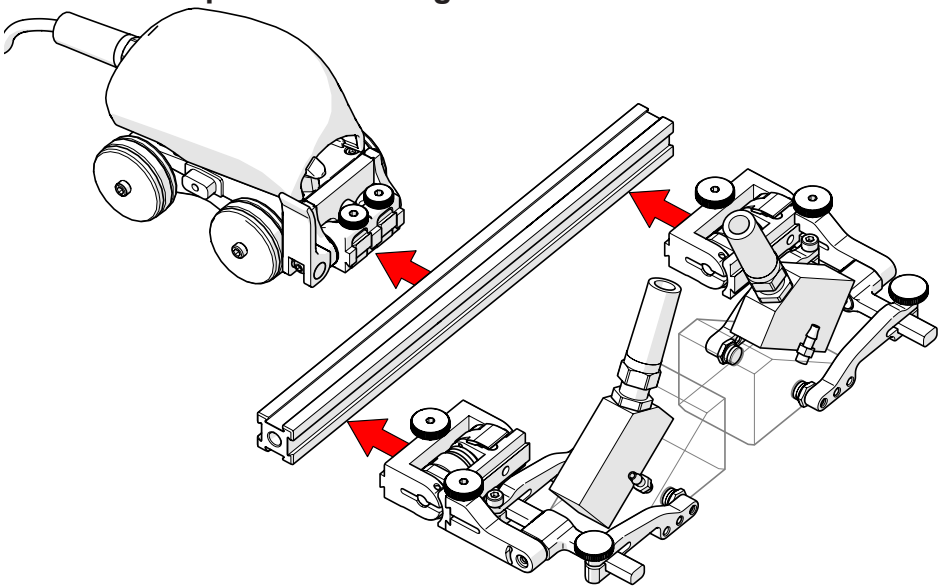


Fig. 11 - Assemble configuration

1. Assemble the appropriate configuration to the scanner body *(Fig. 11)*. Install the wedge and probes that will be used *(see Slip Joint Probe Holder on page 11)*.
2. Route cables and hoses through the scanner body as a means of cable management *(Fig. 12)*
3. Ensure scanner body brake is locked *(see Brake Handle on page 7)*.
4. Place the configured ***MICROBE*** on the scan surface *(Fig. 13)*.

> ***TIP:*** *Use caution when placing equipment on the scan surface. The magnetized wheels can cause the assembly to jump towards the inspection surface.*

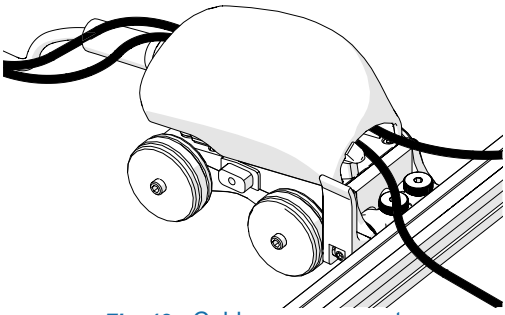


Fig. 12 - Cable management

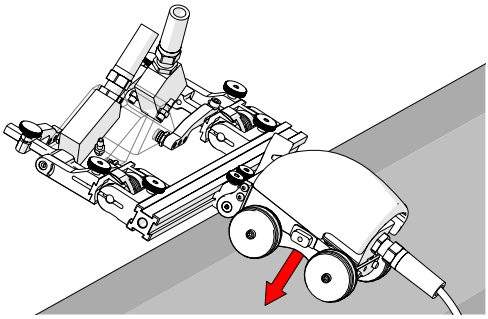


Fig. 13 - Place on scan surface

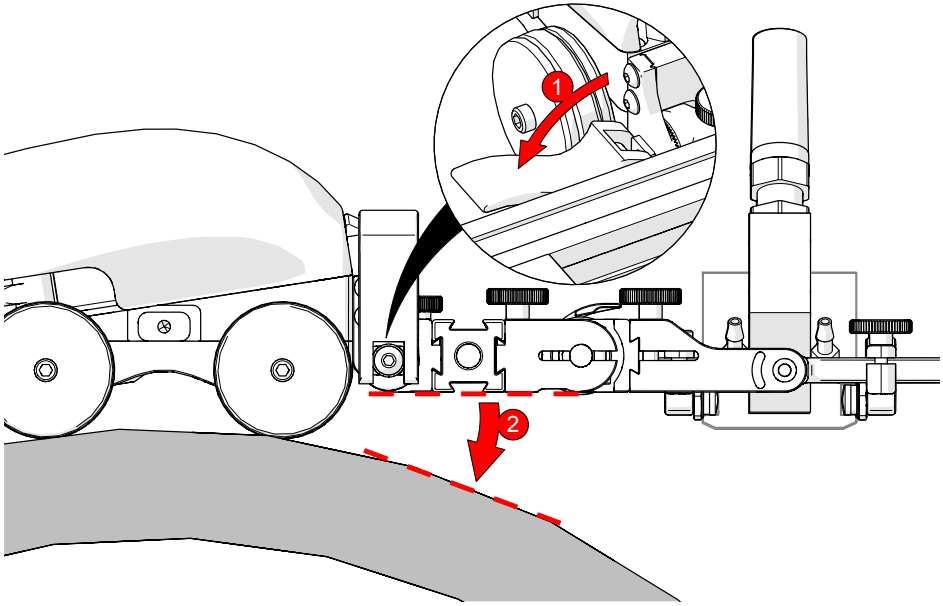


Fig. 14 - Lower pivot nose

5. Adjust the pivot nose *(Fig. 14)* angle to align the frame bar parallel with the tangent of the scan surface *(Fig. 15)*.

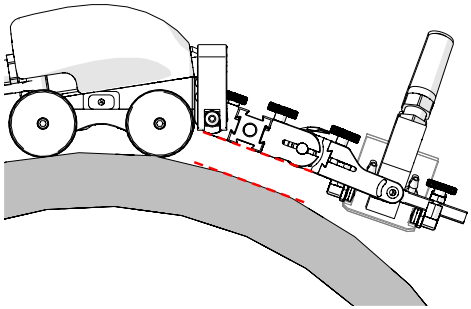


Fig. 15 - Parallel with scan surface tangent

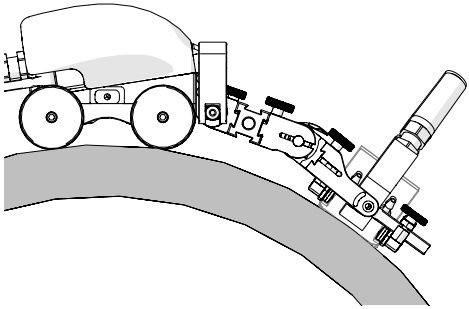


Fig. 16 - Parallel with scan surface tangent

6. Lower the probes to the scan surface *(see Probe Holder Adjustment on page 13)* to begin scan process *(Fig. 16)*.

4.1. Scanner

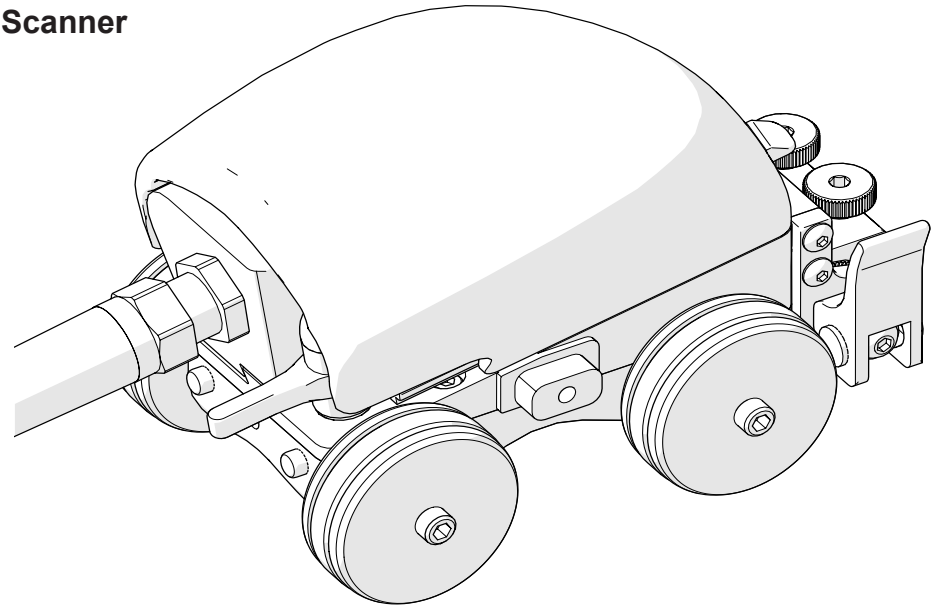


Fig. 17 - Scanner body

4.1.1. Scanner Body

A housing for the main encoder and provides a mounting base for probe holders and the umbilical housing *(Fig. 17)*.

4.1.2. Scanner Handle

The handle is used to both manage cabling and provide an ergonomic grip during use.

To remove the scanner handle, simultaneously depress the handle release catch and slide forward *(Fig. 18)*.

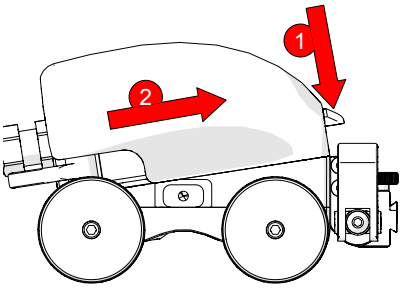


Fig. 18 - Scanner handle removal

4.1.3. Brake Handle

Pivot the brake handle left or right to engage or disengage the brake.

To remove the brake handle, pull straight up on the central knob of the black lever. *(Fig. 19)*. To reinsert, align the spline on the handle with the socket and press down until it snaps into place.

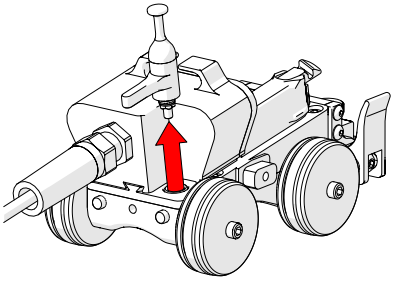


Fig. 19 - Brake handle removal

NOTE: *Pulling the brake handle sideways causes binding and makes the handle difficult to remove.*

4.1.4. Wheels

The scanner body wheels are inter-changeable.

To remove/install the scanner wheels, insert the provided 3 mm hex driver *(Fig. 1)* in the end of the shaft opposite the wheel you wish to remove. Thread or unthread the desired wheel by hand *(Fig. 20)*. Additional magnetic wheels may be installed when added magnetic attraction is necessary *(see Magnetic Wheel Kit on page 24)*.

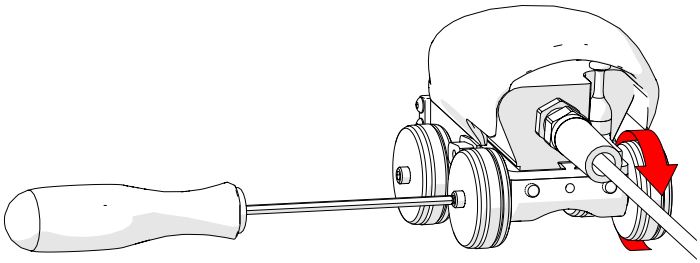


Fig. 20 - Umbilical housing removal

> ***TIP:*** *Be sure all wheels are tight as this can affect the brake and encoder performance.*

> **WARNING! MAGNETIC MATERIAL**. The stabilizer wheel uses a magnetic wheel. People with pacemakers or ICD's must stay at least 25 cm *(10 in)* away.

4.1.5. Umbilical Housing

The umbilical transmits encoder signals to the user instrument.

To remove the umbilical, first remove the scanner handle *(Fig. 18)* and brake handle *(Fig. 19)*. Locate the black wing knob at the bottom of the scanner and loosen one turn *(Fig. 21)*.

With the knob loose, slide the umbilical housing towards the rear of the scanner *(Fig. 22)*.

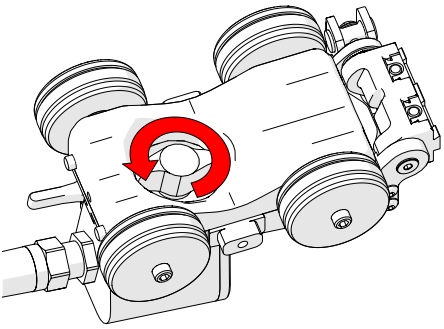


Fig. 21 - Umbilical housing lock knob

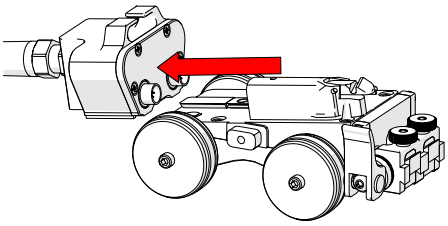


Fig. 22 - Umbilical housing removal

> ***TIP:*** *The umbilical lock knob is only required to be loose, one turn should be enough to remove the umbilical.*

> ***TIP:*** *If the umbilical does not slide freely from the body, you may need to push on the wing knob to loosen the dovetail nut.*

4.1.6. Frame Bar

Frame bars *(Fig. 23)* are used to mount probe holders, probe positioning systems and other accessories.

Frame bars are available in a variety of lengths *(see Frame Bars on page 33)*.

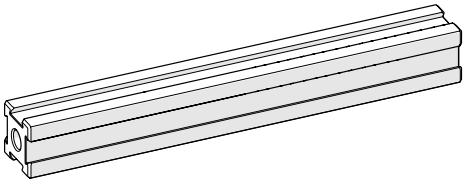


Fig. 23 - Frame bar

4.1.7. Pivot Nose

The pivot nose offers an attachment point for various frame bars.

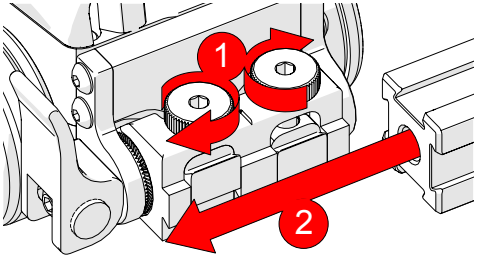


Fig. 24 - Frame bar attachment

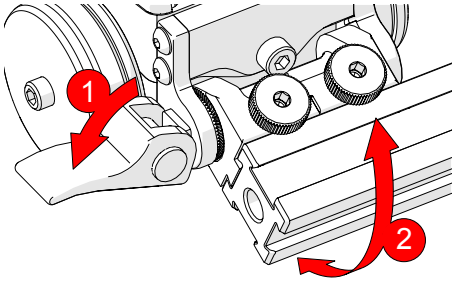


Fig. 25 - Pivot

To attach a frame bar, loosen both dovetail jaws enough to allow the frame bar to be inserted and tighten the knobs *(Fig. 24)*.

The angle of the bar can be adjusted by loosening the side mounted lever, pivoting to the desired angle, and closing the lever again *(Fig. 25)*.

4.1.8. Pivot Tail

The pivot tail is positioned at the rear of the scanner body and provides an attachment point for various frame bars. To mount a pivot tail follow these steps:

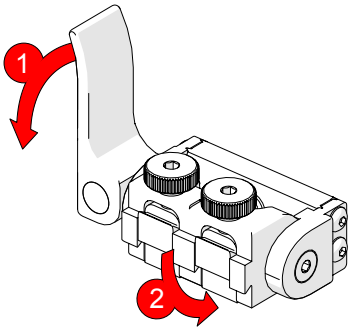


Fig. 26 - Rotate pivot 90° down

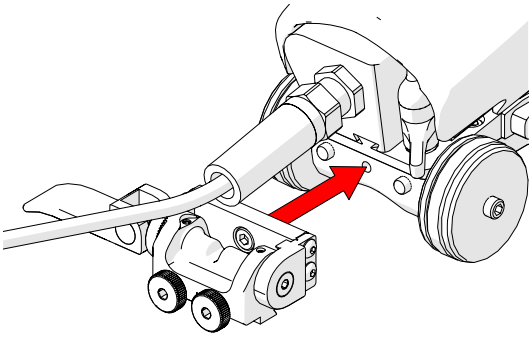


Fig. 27 - Position on scanner body

1. Release the side mounted lever and rotate the pivot down 90° *(Fig. 26)*.
2. Align the pivot tail with the pins at the rear of the scanner body *(Fig. 27)*.

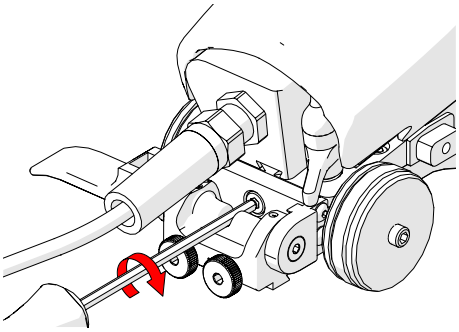


Fig. 28 - Screw to scanner body

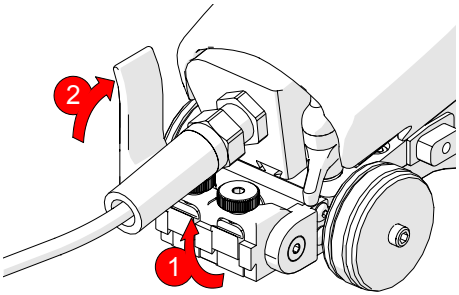


Fig. 29 - Return pivot position

3. Using the supplied 3 mm hex driver, screw the pivot nose to the scanner body *(Fig. 28)*.
4. Rotate the pivot to the original position and lock the side mounted lever *(Fig. 29)*.

4.1.9. Pivot Buttons

Available in a variety of shapes and sizes fitting various wedge dimensions.

Use the supplied 3/8 wrench *(Fig. 2)* to remove and install pivot buttons in the desired hole location *(Fig. 30)*.

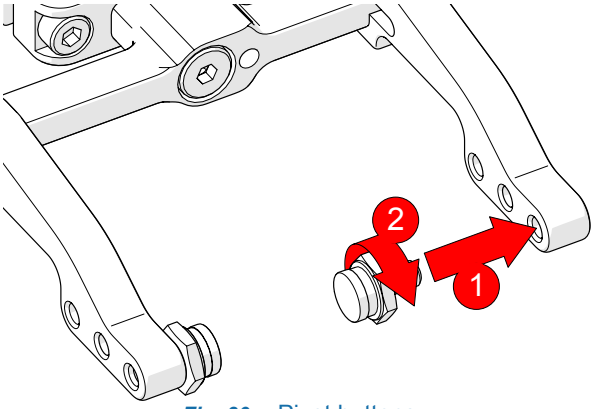


Fig. 30 - Pivot buttons

4.2. Slip Joint Probe Holder

A	Frame Bar
B	Probe Holder Adjustment Knob
C	Latch
D	Swing Arm Knob
E	Yoke
F	Probe Holder Arm Adjustment Knob
G	Probe Holder Arm
H	Arm Clamp Screw
I	Pivot Buttons

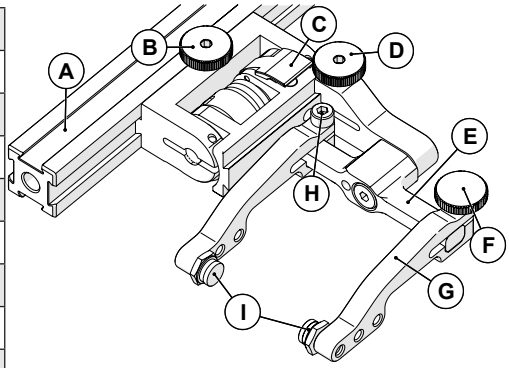


Fig. 31 - Slip Joint Probe Holder

4.2.1. Probe Holder Setup

To mount a UT wedge in the probe holder, follow these steps:

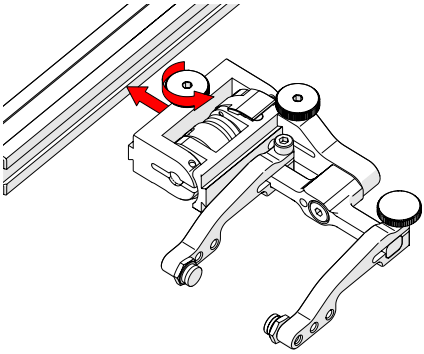


Fig. 32 - Attach to frame bar

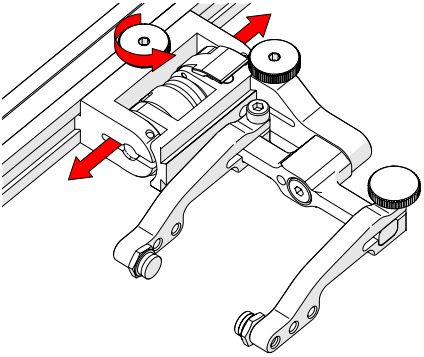


Fig. 33 - Adjust on frame bar

1. Rotate the probe holder adjustment knob and attach probe holder to a frame bar *(Fig. 32)*.
2. Use the probe holder adjustment knob to position the probe holder along the frame bar *(Fig. 33)*.

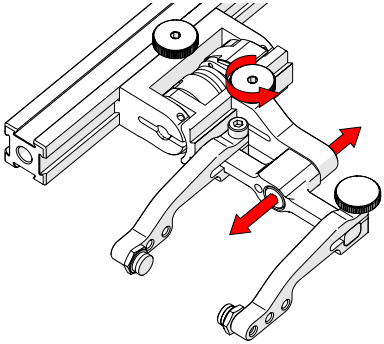


Fig. 34 - Adjust swing arm

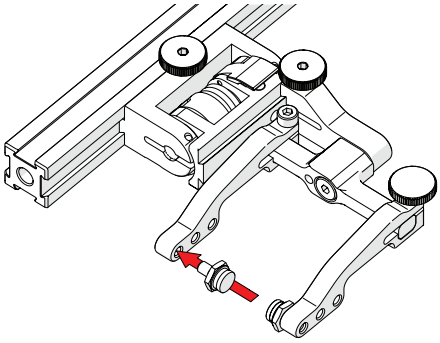


Fig. 35 - Place pivot buttons

3. Use swing arm knob to position the swing arm *(Fig. 34)*.

> ***TIP:*** *The swing arm is typically used to adjust TOFD center to center distance relative to the phased array probes on a four probe configuration (Fig. 10).*

4. Using the supplied 3/8 in wrench *(Fig. 2)*, place the pivot buttons as required *(Fig. 35)*.

> ***TIP:*** *If narrow scanning footprint is required, use pivot button holes closest to the yoke. Wedge pivoting may be impeded when closer to the yoke.*

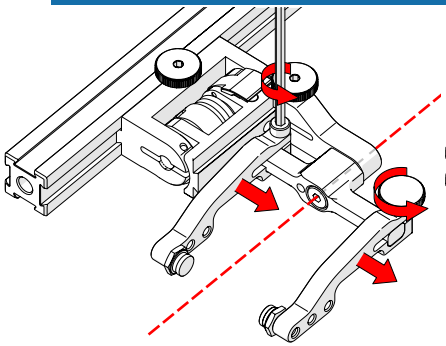


Fig. 36 - Adjust probe holder arms

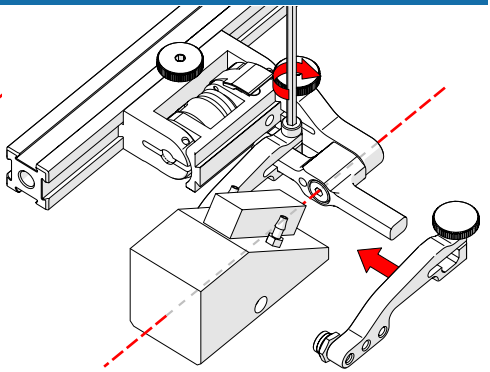


Fig. 37 - Place wedge

5. Loosen the probe holder arm adjustment knob *(Fig. 36)* and remove outer probe holder arm from yoke.
6. Adjust inner probe holder arm as required to best centre the probe on the yoke's pivot axis *(Fig. 36)*.

> ***TIP:*** *The probe holder yoke can accommodate many different probe and wedge sizes of varying widths. It is best to centre the wedge with the yoke's pivot axis to reduce wedge tipping when scanning. Position the inner probe holder arm accordingly with the centre of the yoke (Fig. 36).*

7. Position the wedge on the inner probe holder arm *(Fig. 37)*.
8. Slide outer probe holder arm along the yoke pinching the wedge in place.
9. Tighten probe holder arm adjustment knob *(Fig. 38)*.

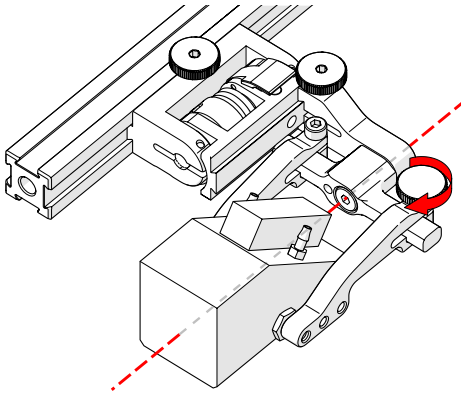


Fig. 38 - Pinch wedge with arm

4.2.2. Probe Holder Adjustment

To adjust the probe holder, follow these steps:

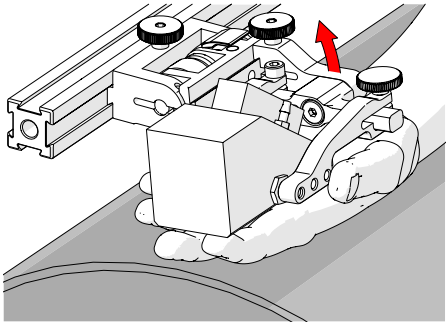


Fig. 39 - Lift to Latched position

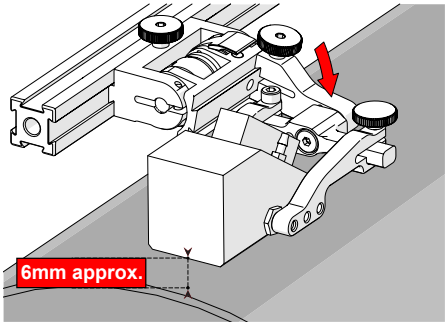


Fig. 40 - Lower to scanning surface

1. Ensure probe holder is in latched, upper position *(Fig. 39)*. If the probe holder is already latched, it will only move within the slip joint adjustment range and have no spring tension.
2. Push the probe holder yoke down toward inspection surface until the wedge is approximately 6 mm *(¼ in)* above the inspection surface *(Fig. 40)*.

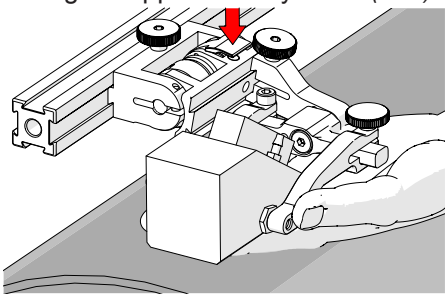


Fig. 41 - Lift and press latch button

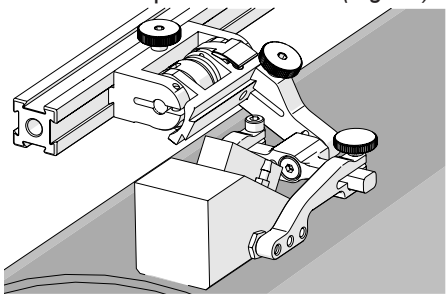


Fig. 42 - Spring loaded scan position

3. Lift probe slightly and press latch button *(Fig. 41)* to apply spring pressure to the wedge.
4. Gently lower probe holder and wedge to the scanning surface *(Fig. 42)*.

4.2.3. Probe Holder Force Adjustment

It is possible to adjust the tension of the probe holder spring.

NOTE: *To perform this operation the 2 mm hex wrench (Fig. 4) and 3 mm hex wrench (Fig. 6) is required.*

Light	1 kg	2 lb
Medium	2 kg	4 lb
Heavy	3 kg	6 lb

When configured correctly, these settings exert the indicated spring force on the Probe.

To adjust the probe holder's force, follow these steps:

***NOTE:** Do not perform this operation on scanning surface.*

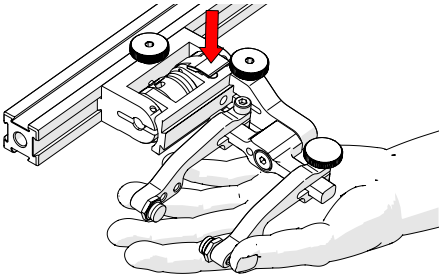


***Fig. 43** - Lift slightly and press Latch*

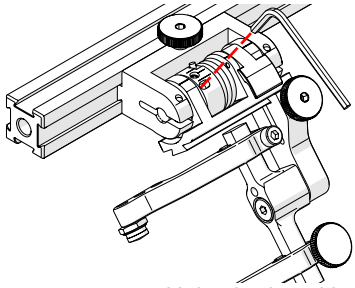


***Fig. 44** - Unlatched position*

1. Ensure the probe holder is in the upright latched position *(Fig. 39)*.
2. Lift probe holder slightly and press the latch button *(Fig. 43)* to release the probe holder the full 45° degrees.
3. Insert the short arm of a 3 mm hex wrench into the 3 mm slot *(Fig. 44)*.

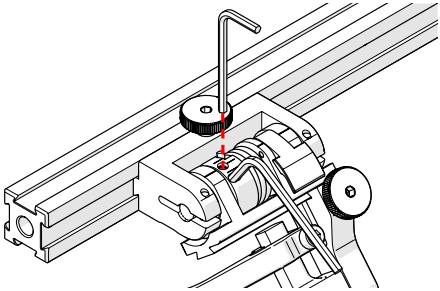


***Fig. 45** - Insert hex wrenches*

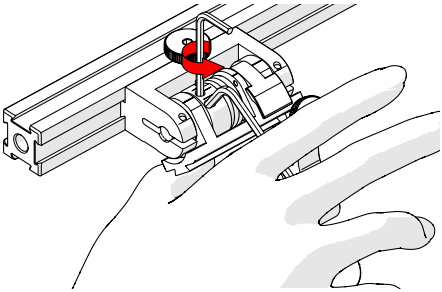


***Fig. 46** - Press 3 mm hex wrench down*

4. Place the 2 mm hex wrench into the force adjustment screw *(Fig. 45)*.
5. Lightly press the long arm of the 3 mm hex wrench down. Using the 2 mm hex wrench, loosen the force adjustment screw but do not remove it *(Fig. 46)*.
6. Gently apply pressure on the long leg of the 3 mm hex wrench until the force adjustment marker lines up with the desired spring tension. While keeping the markers in line, tighten the force adjustment screw *(Fig. 47)*.

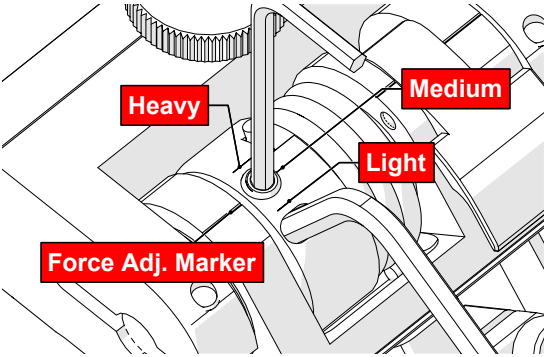


***Fig. 47** - Choose desired tension*

4.2.4. Slip Joint Probe Holder Left/Right Conversion

To reverse the probe holder, follow these steps:

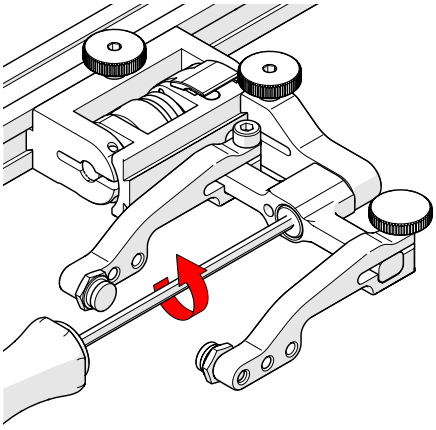


Fig. 48 - Unscrew yoke pivot screw

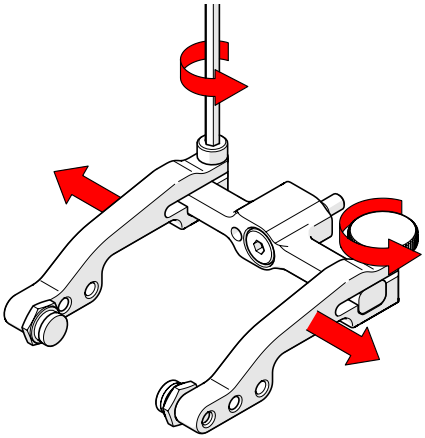


Fig. 49 - Remove arms

1. Unscrew the yoke from the swing arm *(Fig. 48)*.
2. Loosen the probe holder arm adjustment knob and arm clamp screw. Slide the arms from the yoke *(Fig. 49)*.

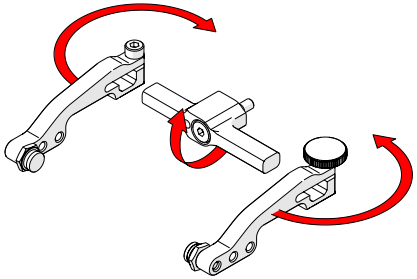


Fig. 50 - Flip yoke and reverse arms

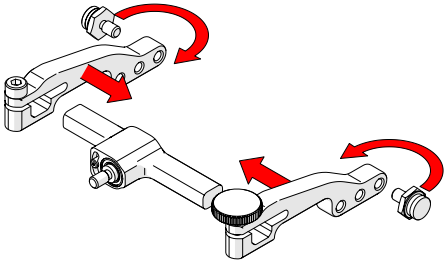


Fig. 51 - Attach arms and move buttons

3. Flip the yoke 180° and reverse the probe holder arms *(Fig. 50)*.
4. Place the pivot buttons on the inside of the probe holder arms *(Fig. 51)* using a 3/8 in wrench *(Fig. 2)*. Slide the arms onto the yoke and tighten the probe holder arm adjustment knob and the arm clamp screw.

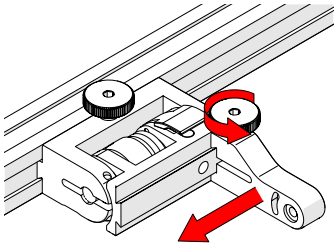


Fig. 52 - Position swing arm

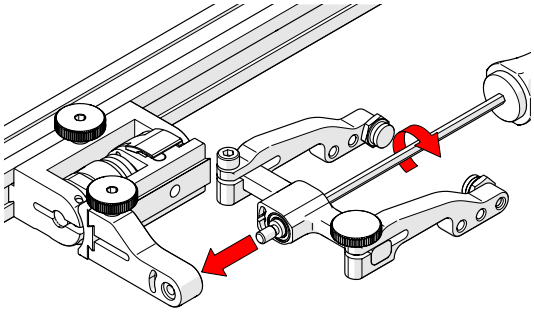


Fig. 53 - Install yoke to swing arm

5. Loosen the swing arm knob and slide the swing arm to the opposite end of the probe holder bracket *(Fig. 52)* or preferred position. Tighten swing arm knob.
6. Using the 3 mm hex driver, screw the yoke pivot screw into the opposite side of the probe holder swing arm *(Fig. 53)*. Ensure the yoke is level to avoid issues with the plunger/set screw.

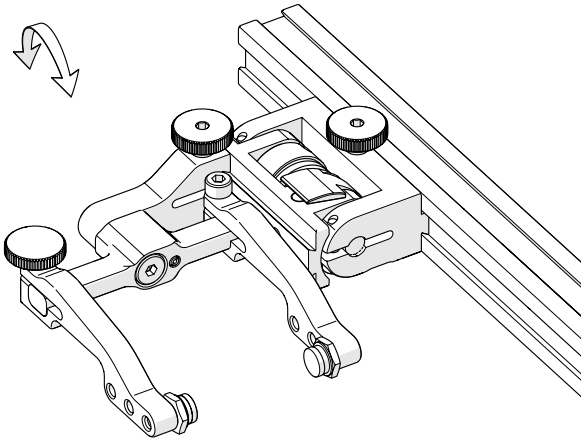


Fig. 54 - Reversed probe holder

4.3. Vertical Probe Holder

A	Latch
B	Probe Holder Adjustment Knob
C	Vertical Adjustment Knob
D	Pivot Buttons
E	Probe Holder Arms
F	Yoke
G	Probe Holder Arm Adjustment Knob
H	Transverse Adjustment Screw
I	Frame Bar

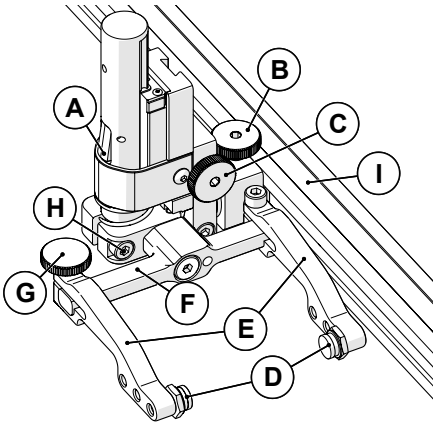


Fig. 55 - Vertical probe holder

4.3.1. Probe Holder Setup

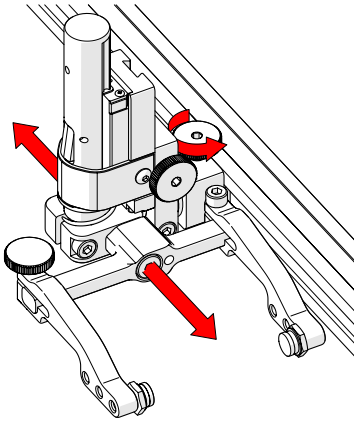


Fig. 56 - Adjust on frame bar

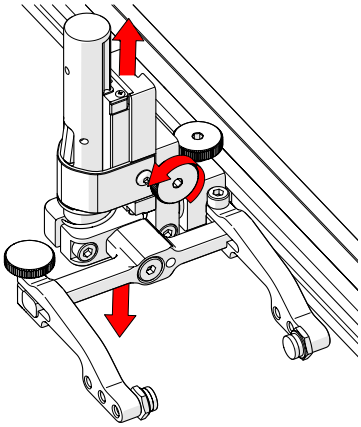


Fig. 57 - Vertical adjustment

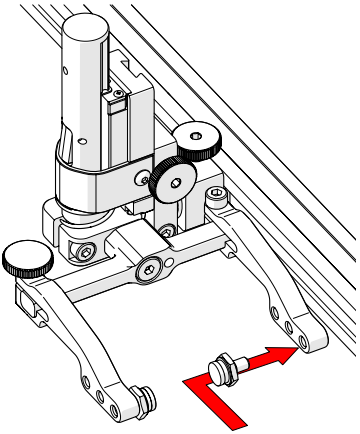


Fig. 58 - Place buttons

1. The probe holder adjustment knob allows the probe holder to be attached to a frame bar, as well as horizontal positioning on a frame bar *(Fig. 56)*.
2. Vertical adjustment knob allows the vertical probe holder height adjustment *(Fig. 57)*.
3. Position the pivot buttons where necessary *(Fig. 58)*. When a narrow scanning footprint is required, use the pivot button holes closet to the yoke.

TIP: *Probe pivoting may be impeded when closer to the yoke.*

To mount a UT wedge in the probe holder, follow these steps:

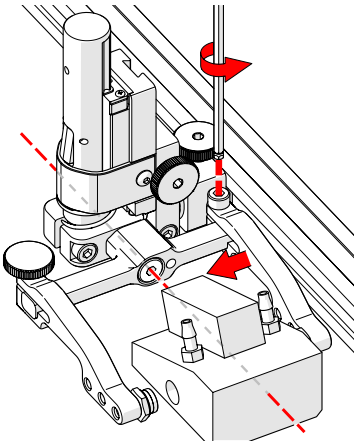


Fig. 59 - Adjust inner arm

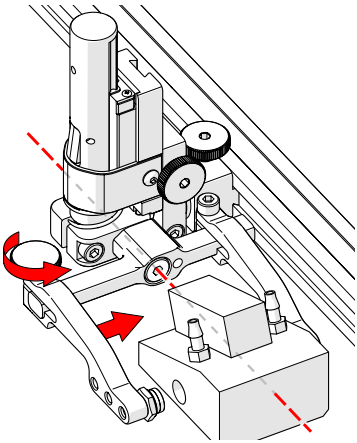


Fig. 60 - Adjust outer arm

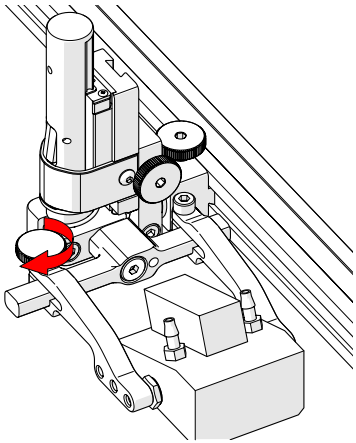


Fig. 61 - Tighten arm knob

4. Position the wedge on the inner probe holder arm *(Fig. 59)*.

   TIP: *The probe holder yoke can accommodate many different probe and wedge sizes of varying widths. It is best to centre the wedge with the yoke's pivot axis. This can reduce wedge tipping when scanning. Position the inner probe holder arm accordingly (Fig. 59) using the supplied 3 mm hex driver (Fig. 1).*

5. Loosen the probe holder arm adjustment knob *(Fig. 60)* and slide the probe holder arm along the yoke pinching the wedge in place.

6. Tighten the probe holder arm adjustment knob *(Fig. 61)*.

4.3.2. Probe Holder Vertical Adjustment

To adjust the probe holder vertically, follow these steps:

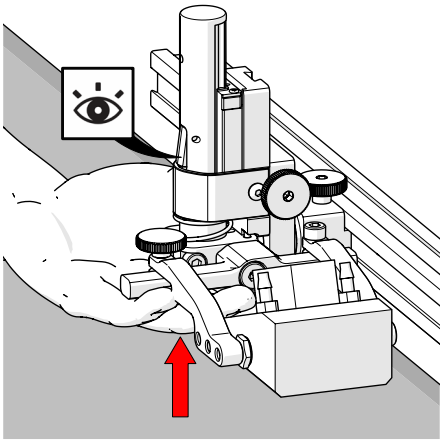


Fig. 62 - Latch probe holder

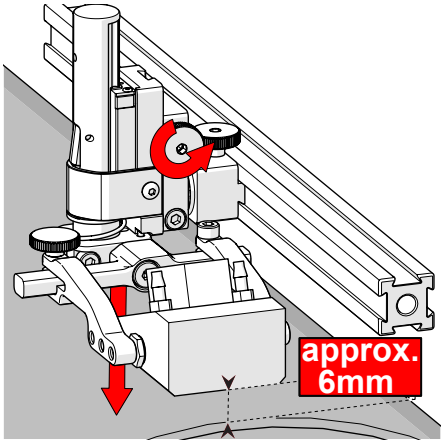


Fig. 63 - Lower toward scan surface

1. Ensure the probe holder is in the latched, upper position. Do this by lifting the probe holder till the latch is fully exposed and snaps out to lock *(Fig. 62)*.
2. Loosen the vertical adjustment knob and slide the probe holder down until the wedge is approximately 6 mm *(¼ in)* above inspection surface *(Fig. 63)*.
3. Tighten the vertical adjustment knob.

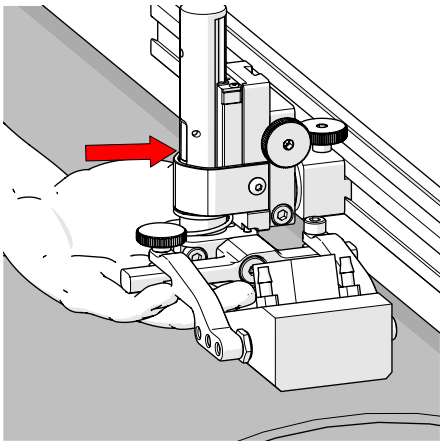


Fig. 64 - Press latch button

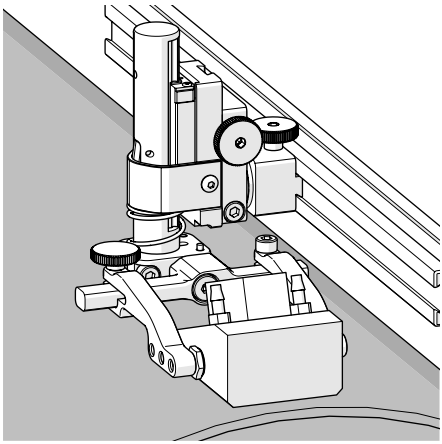


Fig. 65 - Lower toward scan surface

4. Lift the yoke slightly and press the latch button *(Fig. 64)*, then slowly lower towards scanning surface to apply spring pressure to the wedge *(Fig. 65)*.

> ***TIP:*** *If less spring force is desired, refer to step 2 and place the wedge approximately 20 mm (¾ in) above inspection surface.*

4.3.3. Probe Holder Transverse Adjustment

To adjust the probe holder's transverse angle, follow these steps:

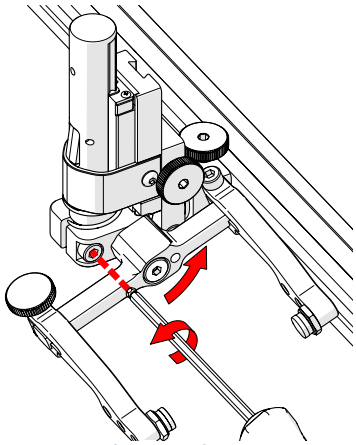


Fig. 66 - Loosen 3 mm screw

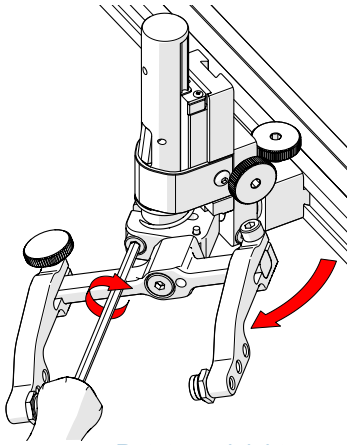


Fig. 67 - Rotate and tighten

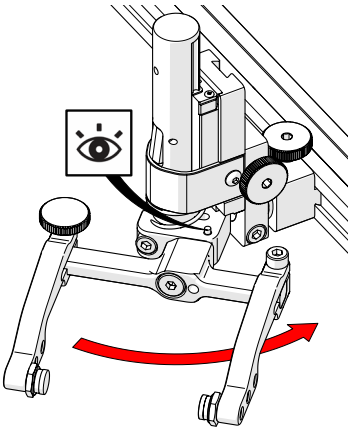


Fig. 68 - Stop post locates 90°

1. Ensure the probe holder is in latched, upper position *(Fig. 62).*
2. Using the supplied 3 mm hex driver loosen the transverse adjustment screw *(Fig. 66)* and rotate the yoke about the vertical shaft achieving the desired angle.
3. Tighten the transverse adjustment screw *(Fig. 67)*.

To return the transverse adjustment to neutral (90°). The probe holder must be in the latched, upper position *(Fig. 62).* Rotate the yoke until the stop post contacts the base of the probe holder *(Fig. 68).* Then tighten the transverse adjustment screw.

4.3.4. Probe Holder Longitudinal Adjustment

To adjust the probe holder's vertical angle for longitudinal scanning, follow these steps:

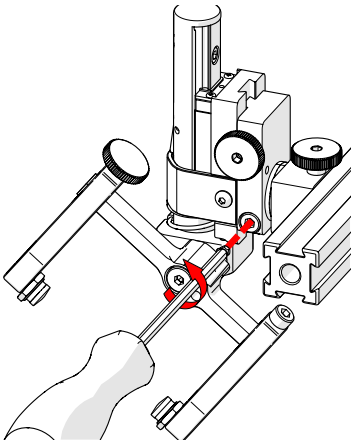


Fig. 69 - Loosen 3 mm screw

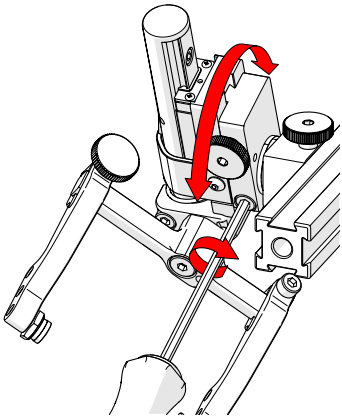


Fig. 70 - Rotate to position

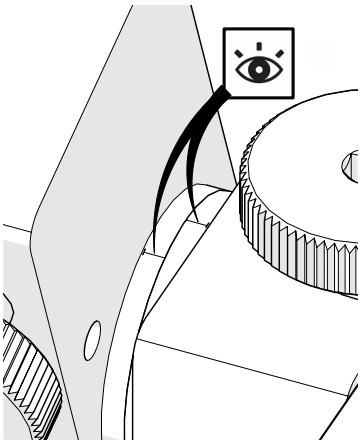


Fig. 71 - Line up markers

1. Ensure the probe holder is in latched, upper position *(Fig. 62)*.
2. Using the supplied 3 mm hex driver *(Fig. 1)*, loosen the longitudinal adjustment screw *(Fig. 69)*.
3. Rotate the main body of the probe holder until it is at the desired angle.
4. Tighten the longitudinal adjustment screw *(Fig. 70)*.

To return the longitudinal adjustment to neutral (90°). Line up the longitudinal adjustment indicator markers *(Fig. 71)*.

4.3.5. Probe Holder Left/Right Conversion

To reverse the probe holder, follow these steps:

NOTE: *To perform this operation the 1.5 mm hex wrench (Fig. 3) is required.*

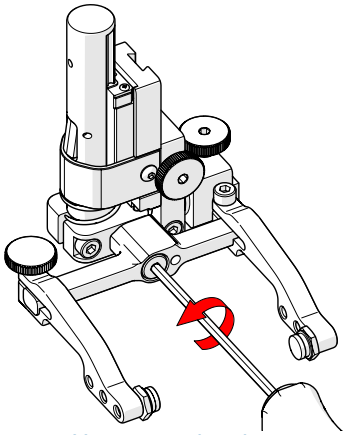


Fig. 72 - Unscrew yoke pivot screw

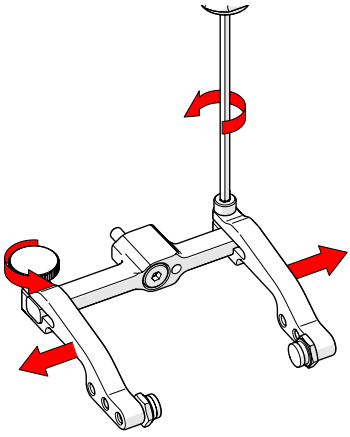


Fig. 73 - Remove probe holder arms

1. Ensure the probe holder is in latched, upper position *(Fig. 62)*.
2. Using the supplied 3 mm hex driver *(Fig. 1)*, unscrew the yoke pivot screw and remove yoke *(Fig. 72)*.
3. Loosen the probe holder arm adjustment knob and the arm clamp screw. Slide the probe holder arms off the yoke *(Fig. 73)*.

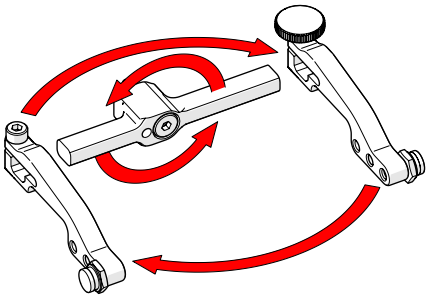


Fig. 74 - Flip yoke and reverse arms

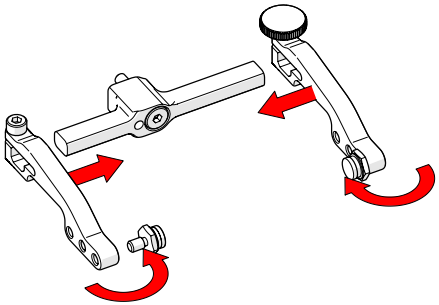


Fig. 75 - Attach arms & move buttons

4. Flip the yoke 180° and swap the probe holder arms *(Fig. 74)*.
5. Place the pivot buttons on the inside of the probe holder arms *(Fig. 75)* using a 3/8 in wrench *(Fig. 2)*.

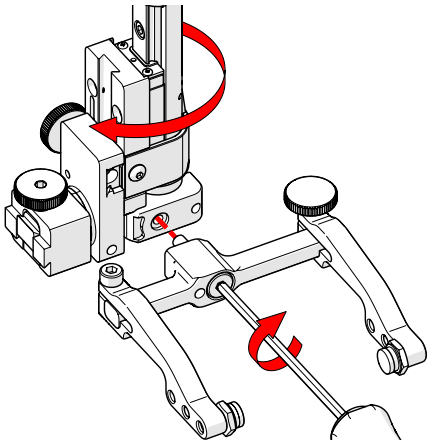


Fig. 76 - Screw yoke to opposite side

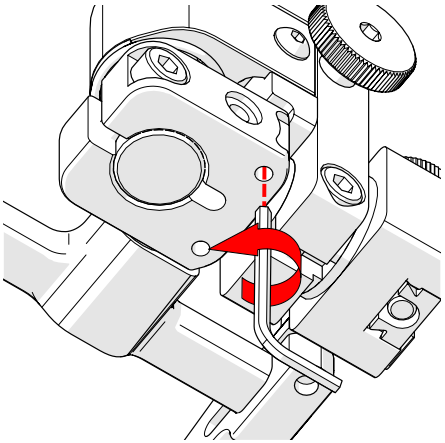


Fig. 77 - Lower 90° stop post

6. Mount the yoke to the opposite side of the base using the supplied 3 mm hex driver *(Fig. 76)*.

> ***TIP:*** *Keep the yoke level with the base as to ensure no conflicts with the plunger/set screw attached to the yoke.*

7. Locate the recessed M3 screw *(stop post)* on the bottom of the probe holder. Unscrew the stop post using a 1.5 mm hex wrench until it has cleared all obstructions. Do not remove stop post *(Fig. 77)*.

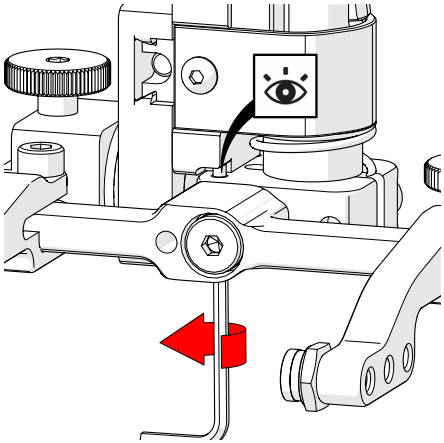


Fig. 78 - Raise opposite 90° stop post

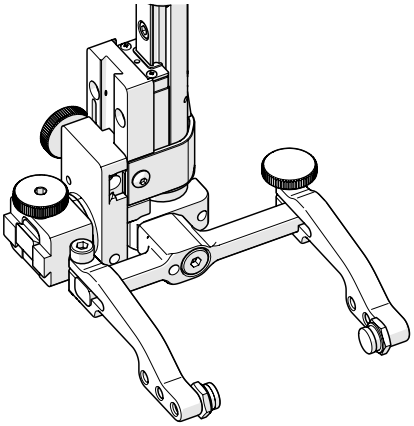


Fig. 79 - Reversed probe holder

8. Raise the stop post on the opposite side until the side of the post clearly contacts the 90° stop point on the probe holder's base *(Fig. 78)*.

4.4. Magnetic Wheel Kit

WARNING! MAGNETIC MATERIAL. The magnetic wheel kit produce a magnetic field which may cause failure or permanent damage to items such as watches, memory devices, CRT monitors, medical devices or other electronics. People with pacemakers or ICD's must stay at least 25 cm *(10 in)* away.

Two sets of the magnetic wheel kits can also be used on the scanner body, thus doubling the magnetic force *(Fig. 80)*.

To install or remove single wheels *(see Wheels on page 8)*.

NOTE: *Magnetic wheels may lose their magnetic properties if heated above 175°F (80° C).*

1. Ensure the four existing wheels are tight *(see Wheels on page 8)*

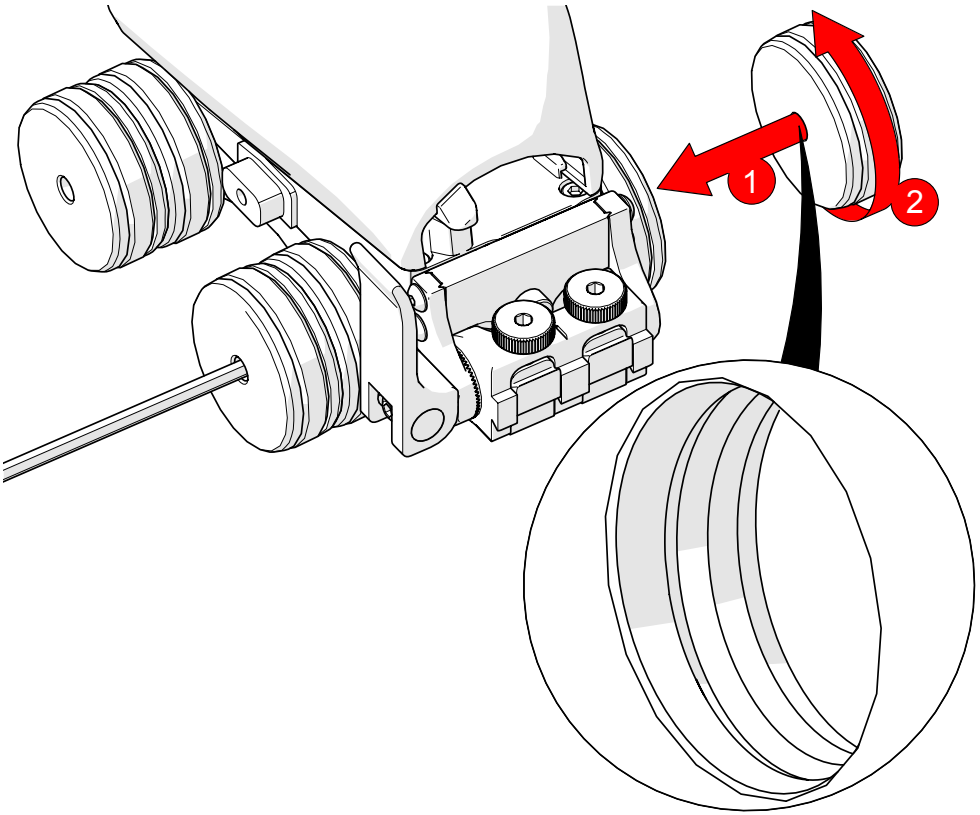


Fig. 80 - Magnetic wheel kit

2. On the magnetic wheel to be attached, locate the threaded side of the

magnetic wheel, orient the threaded side towards the scanner *(Fig. 80)*.

3. Overcome the magnetic resistance to screw the additional wheel to the axle of the wheel block *(Fig. 80-1)*
4. Insert the 3 mm hex driver into the opposite axle and tighten the additional wheel *(Fig. 80-2)*.

***TIP:** To remove additional wheels, reverse these steps.*

4.5. Pre-Amp Bracket

The pre-amp bracket mounts to any dovetail groove to hold a pre-amp. Compatible with most standard pre-amps, use the adjustable screw mounting channel on the bottom of the bracket to attach a pre-amp. The pre-amp bracket may also be ordered with velcro straps which are used to hold the pre-amp.

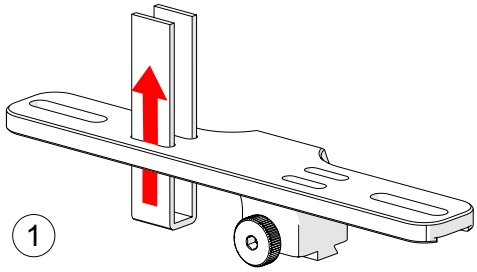


Fig. 81 - Insert velcro straps

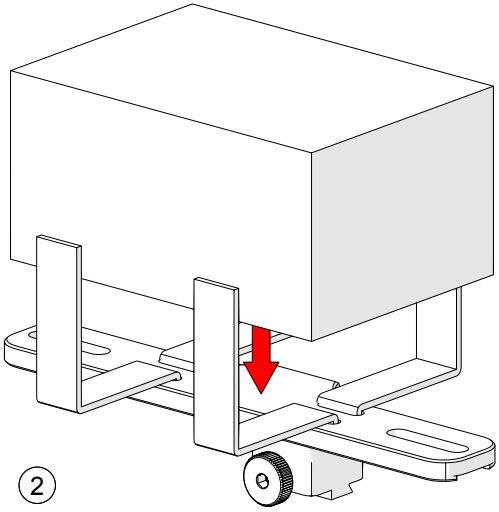


Fig. 82 - Place pre-amp and wrap velcro

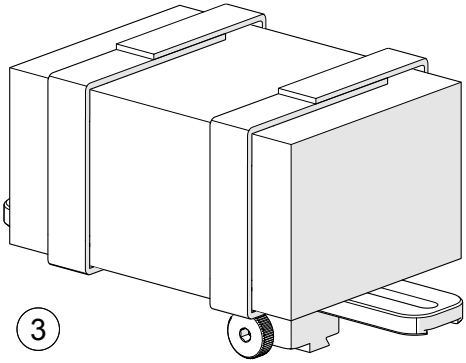


Fig. 83 - Mount bracket on a frame bar

5. Troubleshooting

Problem	Possible Cause	Solution
1. Can not close the side mounted lever on the pivot nose/tail.	The rosettes of the lever and the pivot are not lined up.	Slightly wiggle the pivot nose/tail while locking the side mounted lever allowing the rosettes to properly seat.
2. Insufficient probe contact.	Scanner not set properly.	Reconfigure the scanner as per instructions *(see Probe Holder Adjustment on page 13)*
3. Encoder not working.	Wing knob on bottom of scanner not tight enough and umbilical is loose.	Remove scanner handle and ensure the umbilical is properly plugged into the scanner body. Tighten the black wing knob and ensure no movement of the umbilical housing is possible.
4. Magnetic wheels become loose.	Brakes are engaged.	Ensure the brake is unlocked when using the scanner *(see Brake Handle on page 7)*

6. Spare Parts

To order accessories or replacement parts for your ***MICROBE*** system.
(contact Jireh Industries Ltd. on page i)

NOTE: *These drawings are for parts order. This is not a list of kit contents.*

6.1. Scanner Body

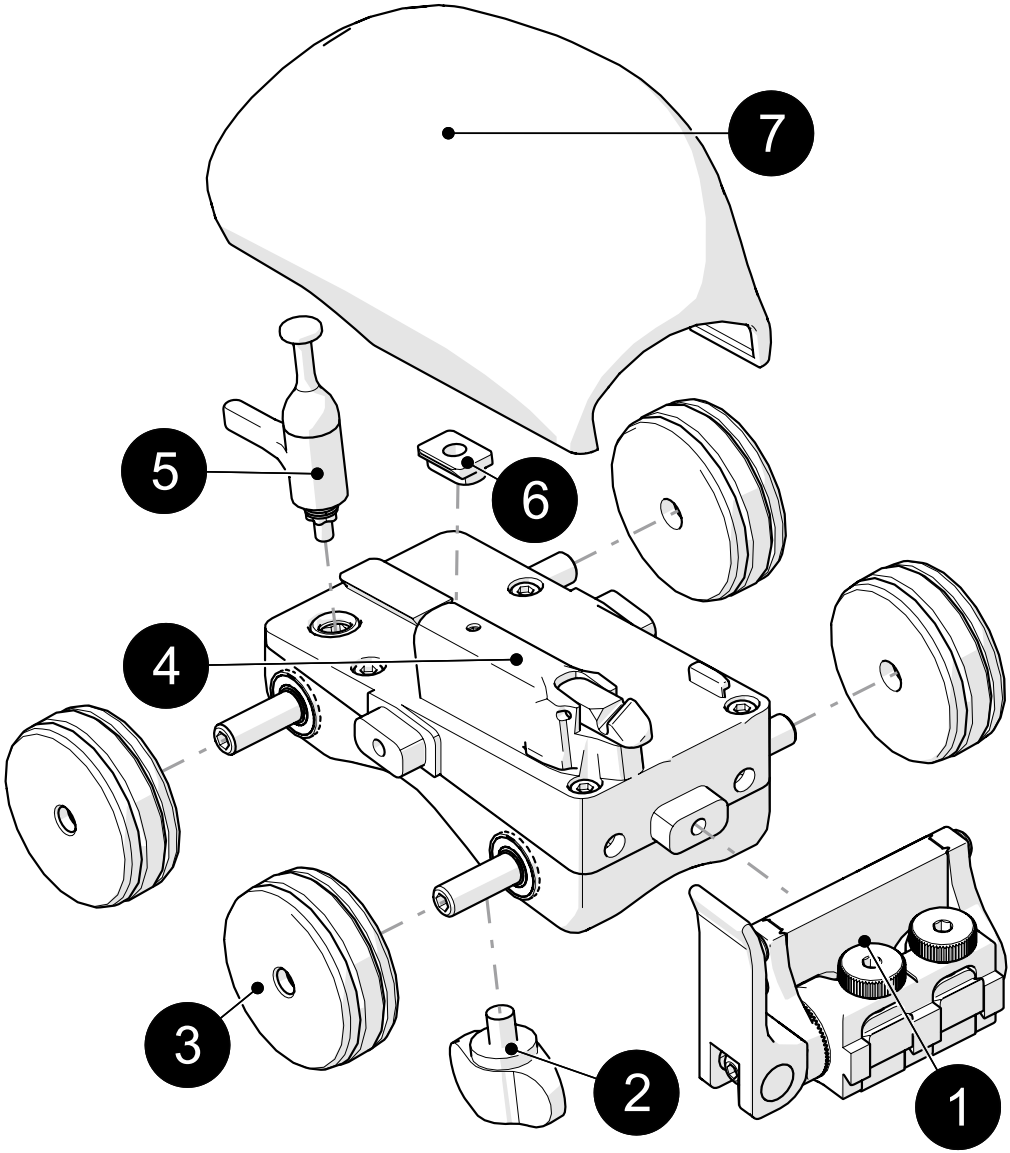
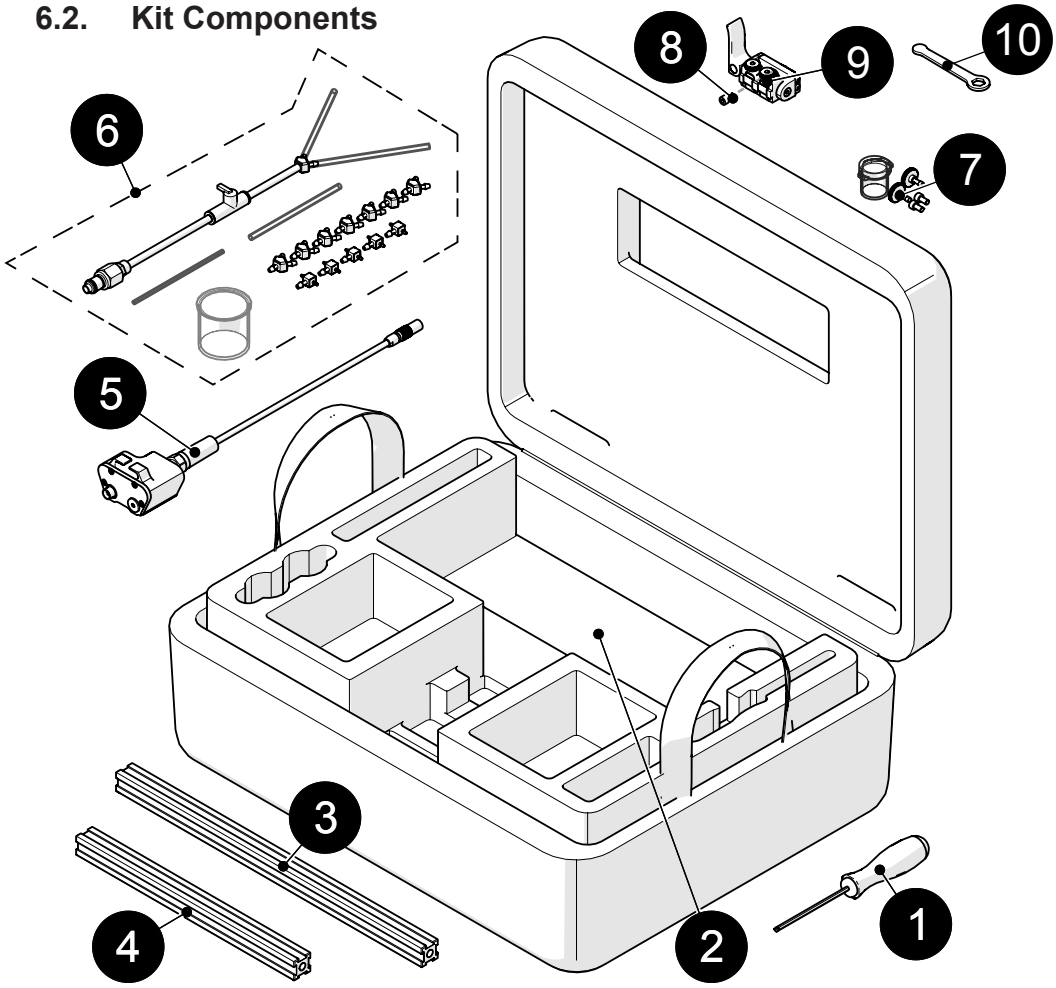


Fig. 84 *- Scanner body parts*

BOM ID	Part #	Description
1	BTS040	Pivot Nose
2	BT0069	Wing Knob
3	BTS031	Magnetic Wheel
4	BTS045	Base Cart
5	BTS046	Brake Handle
6	BT0014	Dovetail Nut
7	BT0150	Handle

Fig. 85 - Scanner body parts (cont.)

6.2. Kit Components



BOM ID	Part #	Description
1	EA414	3 mm Hex Driver
2	BTA002	Microbe Case
3	BG0038-35	Frame Bar, 35 cm *(see 6.6.1)*
4	BG0038-25	Frame Bar, 25 cm *(see 6.6.1)*
5	UMA012-X-05	Umbilical Housing *(see 6.2.1)*
6	CMG007	Irrigation Kit
7	PHG014	Probe Holder Spare Parts Kit, 2 Probe
8	MD050-008	SHCS, M4x0.7 x 8 mm, SST
9	BTS042	Pivot Tail
10	EA470	3/8 in Wrench

Fig. 86 - Kit components

6.2.1. Umbilical Style

Connector Type	Company/Instrument
B	Olympus - OmniScan MX / Zetec - ZIRCON, TOPAZ
C	Olympus - Focus LT / Zetec Z-Scan
D	Olympus - OmniScan MX2, OmniScan SX
F	TD - Focus Scan, Handy Scan, Pocket Scan

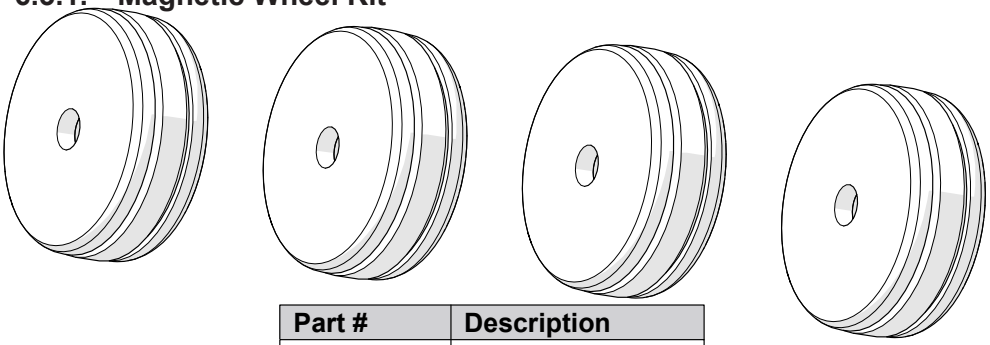
Connector Type	Company/Instrument
G	Sonotron - Isonic
M	GE - USM Vision
U	Sonatest - VEO, PRISMA
V	Pragma PAUT 16/128, PragmaLite

Fig. 87 - Umbilical style

***NOTE:** Additional encoder connector styles available. (contact Jireh Industries Ltd. on page i)*

6.3. Accessories

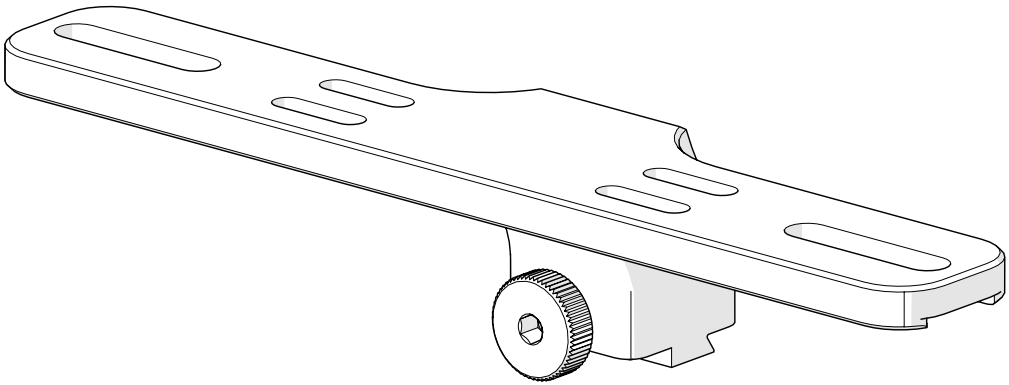
6.3.1. Magnetic Wheel Kit



Part #	Description
BTG014	Magnetic Wheel Kit

Fig. 88 - Magnetic wheel kit

6.3.2. Pre-Amp Bracket

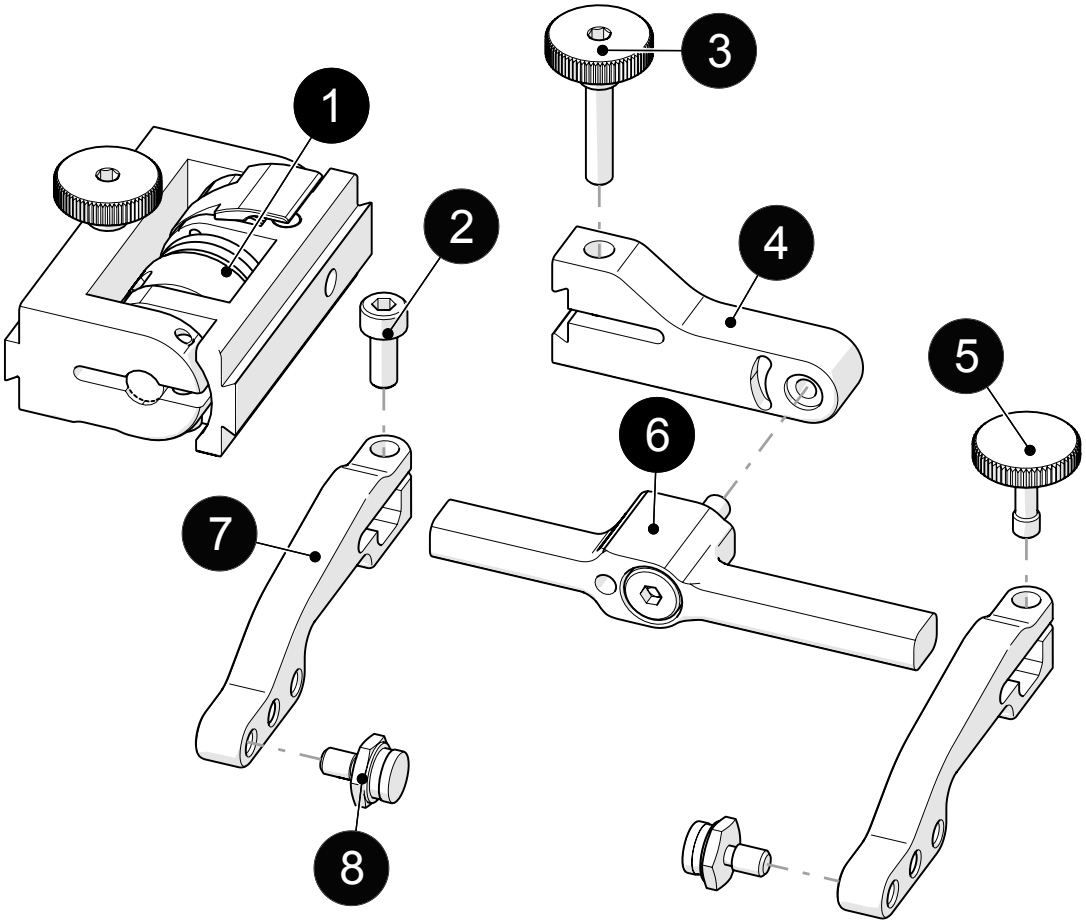


Part #	Description
CES029	Pre-Amp Bracket
CES029-V	Pre-Amp Bracket with Velcro

Fig. 89 - Pre-amp bracket

6.4. Probe Holders

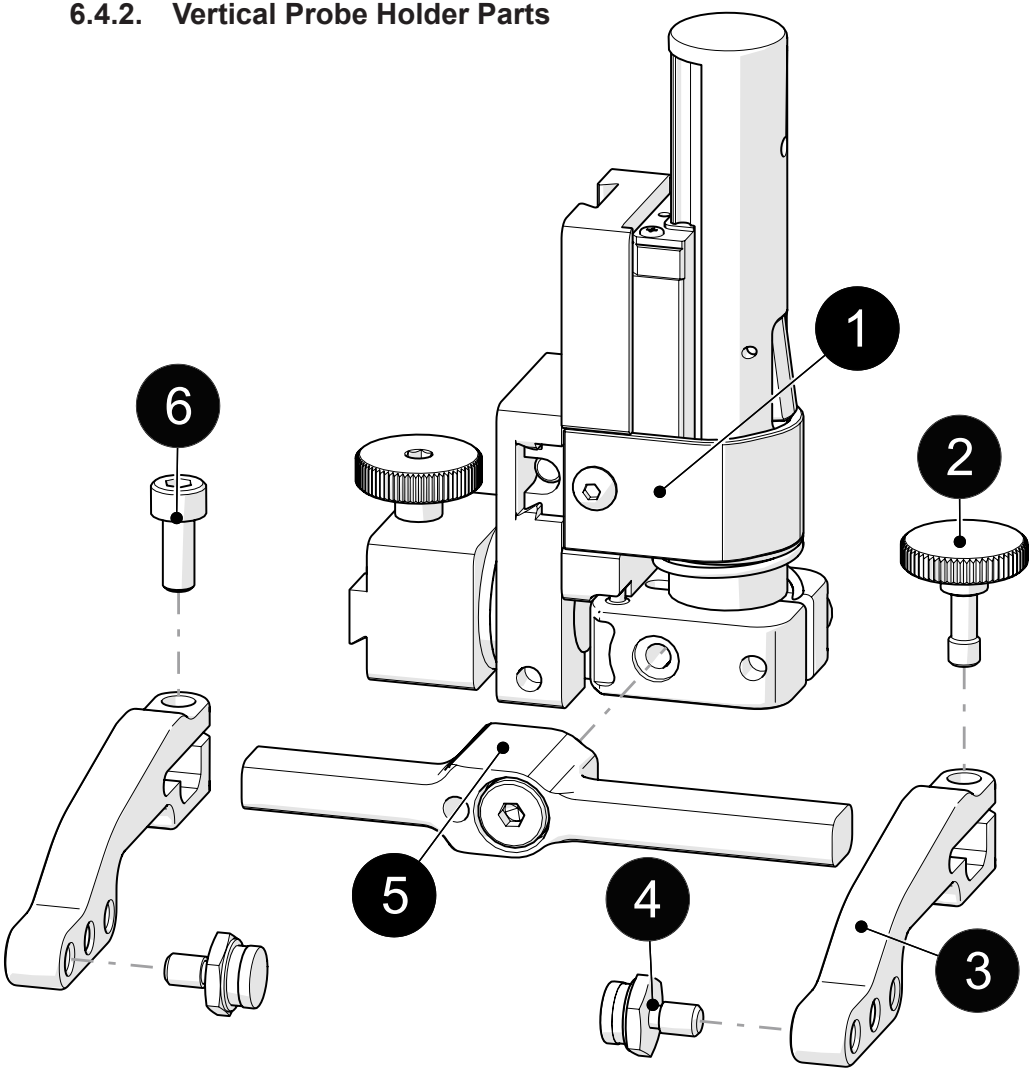
6.4.1. Slip Joint Probe Holder Parts



BOM ID	Part #	Description
1	PHS022	Slip Joint Probe Holder Subassembly
2	MD050-010	Arm Clamp Screw, SHCS, M4x0.7 X 10 mm, SST
3	PH0104	Swing Arm Knob
4	PH0100	Swing Arm
5	PH0082	Probe Holder Arm Adjustment Knob
6	SEE 6.5.2	Yoke Style
7	SEE 6.5.1	Arm Style
8	PH0011-X	Pivot Button Style (*see 6.5.3)*

***Fig. 90** - Slip joint probe holder parts*

6.4.2. Vertical Probe Holder Parts

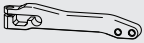


BOM ID	Part #	Description
1	PHS028	Vertical Probe Holder Subassembly
2	PH0082	Probe Holder Arm Adjustment Knob
3	SEE 6.5.1	Arm Style
4	PH0011-X	Pivot Button Style (*see 6.5.3)*
5	SEE 6.5.2	Yoke Style
6	MD050-010	Arm Clamp Screw, SHCS, M4x0.7 X 10 mm, SST

***Fig. 91** - Vertical probe holder*

6.5. Probe Holder Components

6.5.1. Arm Style

	Arm Style	Part #	
A	Standard	PH0090	
C	Long	PH0099	
E	Short, Drop	PH0092	
G	Standard, Extra-Drop	PH0096	

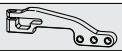
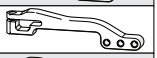
	Arm Style	Part Number	
B	Short	PH0089	
D	Standard, Drop	PH0093	
F	Long, Drop	PH0094	
H	Short, Extra-Drop	PH0095	

Fig. 92 - Probe holder arm selection

6.5.2. Yoke Style

	Yoke Style	Part #	Length	
S	Standard	PHS017	6.27 cm (2.470 in)	

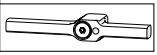
	Yoke Style	Part #	Length	
W	Wide	PHS027	7.78 cm (3.064 in)	

Fig. 93 - Probe holder yoke selection

6.5.3. Pivot Button Style

	Pivot Hole Size	Wedge Type	
01	8.0 mm (0.315 in)	Olympus PA	
03	2.7 mm (0.106 in)	Sonatest DAAH PA	
06	3.0 mm (0.118 in)	-	
08	Conical Head	-	

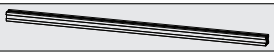
	Pivot Hole Size	Wedge Type	
02	5.0 mm (0.197 in)	Olympus TOFD	
04	9.5 mm (0.375 in)	-	
07	2.3 mm (0.090 in)	-	
09	5 mm (0.197 in) Internal	Zetec PA/TOFD	

Fig. 94 - Probe holder button selection

***NOTE:** Additional probe holder pivot button types available. (contact Jireh Industries Ltd. on page i)*

6.6. Variable Components

6.6.1. Frame Bars

Part #	Length	
BG0038-05	5 cm (1.969 in)	
BG0038-15	15 cm (5.906 in)	
BG0038-25	25 cm (9.843 in)	
BG0038-35	35 cm (13.780 in)	
BG0038-45	45 cm (17.717 in)	
BG0038-55	55 cm (21.654 in)	

Part #	Length	
BG0038-10	10 cm (3.937 in)	
BG0038-20	20 cm (7.874 in)	
BG0038-30	30 cm (11.811 in)	
BG0038-40	40 cm (15.748 in)	
BG0038-50	50 cm (19.685 in)	

Fig. 95 - Frame bar selection

7. Limited Warranty

WARRANTY COVERAGE

Jireh Industries warranty obligations are limited to the terms set forth below: Jireh Industries Ltd. (“Jireh”) warrants this hardware product against defects in materials and workmanship for a period of THREE (3) YEARS from the original date of purchase. If a defect exists, at its option Jireh will (1) repair the product at no charge, using new or refurbished replacement parts, (2) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product, or (3) refund the purchase price of the product. A replacement product/part assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes Jireh’s property. When a refund is given, your product becomes Jireh’s property.

OBTAINING WARRANTY SERVICE

To utilize Jireh’s warranty service you must ship the product, at your expense, to and from Jireh Industries. Before you deliver your product for warranty service you must phone Jireh and obtain an RMA number. This number will be used to process and track your product. Jireh is not responsible for any damage incurred during transit.

EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to hardware products manufactured by or for Jireh Industries. This warranty does not apply: (a) to damage caused by accident, abuse, misuse, misapplication, or non-Jireh products; (b) to damage caused by service (including upgrades and expansions) performed by anyone who is not an Jireh Authorized Service Provider; (c) to a product or a part that has been modified without the written permission of Jireh.

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All specifications are subject to change without notice.

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SCANNING TECHNOLOGY FOR NDT

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